

SEQUENCE LISTING

<110> Korea Research Institute of Bioscience and Biotechnology

<120> Multiple stress-inducible peroxidase promoter derived from
Ipomoea batatas

<130> 4fpo-02-03

<160> 30

<170> KopatentIn 1.71

<210> 1

<211> 1512

<212> DNA

<213> Ipomoea batatas

<400> 1

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aagtggctgc tagacaacac tctagagtcg tcagtggccg acgtgctctc actaogccta 180

ggcatctcct cgggcaagct ttccgacgaa gactgcata tctccgccgt taaggaagtg 240

gtggacgccg ccattgatgc agaaaccgc atgggtgctt ccctcattcg cctcttcttc 300

catgactgct ttgttgatgt acgtacgcta attttgtacg atgatgtttt tttttttttt 360

tttttttttc ccaactgcatt atattaggaa attaaacaga ttgaaatgtg tgttattaat 420

gtattatctg cagggttggtg acgcaggtct tctactaaac gatacaccta ctttcaccgg 480

agaacagacc gccggcggca ataataactc agtcagaggt ttgaggtga tacaacaagc 540

taaagagaat gtgataacca aatgtcccta catacaagta tcttgtgcg acatottatc 600

cattgctgcc cgtgattctt tccagagagt aagtccattt atttctaaag gttgaaatta 660

ataagaacaa gaatccaaac aaataacaga cagtaaaaaa aaaagattta tgtggtttga 720

caatatgttg aaattgtttt tatatttaat gactagtatt tatgcattat atttatatgc 780

aactctaaac atgcagttta ctggagaaac gtacaccgtg actctgggaa gactcgatgc 840

aagaacggcg aaccttaccg gagctaacac ccaactcgtc ggaccaaagc aggaattggc 900

atcgcaagtc gagaaatttg cggcgaaagg gttctccgaa acggagctag tgccttggt 960

agggtttcac acggttggtt ttccgagatg tccgctttta tgcgttccca ttttcatcaa 1020

tcccgcccg gctccacgc tgcaatgcaa ctgtccggtg agtcccgacg acaccgggct 1080

ggtgggcctg gacccactc cgttgacgtg ggaccaaagt ttttactccg acgtggctaa 1140

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 cgaggtgaat gccaacacag ttgcatccat gtgaagtctg ttcccatoga catcaataac 1380
 gtctgtgatt ctgtgaaagt ttctactcga ctgtgaagaa ttttcacttt ctgttggttc 1440
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 ataaatttgt ta 1512

<210> 2
 <211> 110
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(110)
 <223> -110 deletion promoter

<400> 2
 tttccctttc aagttctcta ttttaaggaag cctgagaagc cattaatcct catcatcagc 60
 tcgaccactc atttcttctt catacttctt ttgctgtgat aatcatcatc 110

<210> 3
 <211> 177
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(177)
 <223> -177 deletion promoter

<400> 3
 aaattaaatc tcagtttgct ttattatatt attatcaaca ataataattt aatactgac 60
 gaagaacttt ccctttcaag ttctctattt aaggaagcct gagaagccat taatcctcat 120
 catcagctcg accactcatt tcttcttcat acttcctttg ctgtgataat catcatc 177

<210> 4
 <211> 306
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter

<222> (1)..(306)
 <223> -306 deletion promoter

<400> 4
 taagggtgttt tatcgtggca gcatgagtgc atgacaaacg catatattat tattaaaaca 60
 aaatagtact ccaatcataa taaattatct tatattatat tgccaacaat taaaaattca 120
 aattagaaca aattaaatct cagtttgctt tattatatta ttatcaacaa taataattta 180
 atactgatcg aagaactttc cctttcaagt tctctattta aggaagcctg agaagccatt 240
 aatcctcatc atcagctcga ccactcattt cttcttcata cttcctttgc tgtgataatc 300
 atcatc 306

<210> 5
 <211> 366
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(366)
 <223> -366 deletion promoter

<400> 5
 tagtataatg aaataaagtt aatcattctc tatatttgat gatggtaatt agtatcatgg 60
 taagggtgttt tatcgtggca gcatgagtgc atgacaaacg catatattat tattaaaaca 120
 aaatagtact ccaatcataa taaattatct tatattatat tgccaacaat taaaaattca 180
 aattagaaca aattaaatct cagtttgctt tattatatta ttatcaacaa taataattta 240
 atactgatcg aagaactttc cctttcaagt tctctattta aggaagcctg agaagccatt 300
 aatcctcatc atcagctcga ccactcattt cttcttcata cttcctttgc tgtgataatc 360
 atcatc 366

<210> 6
 <211> 433
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(433)
 <223> -433 deletion promoter

<400> 6
 atggtgactt aaagggctga atccaacata tattotgaca tttaaaaatg ctaacgtacg 60

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gtagattag tataatgaaa taaagttaat cattctctat atttgatgat ggtaattagt 120
atcatggtaa ggtgttttat cgtggcagca tgagtgcacg acaaacgcac atattattat 180
taaaacaaaa tagtactcca atcataataa attatcttat attatattgc caacaattaa 240
aaattcaaat tagaacaacat taaatctcag ttgtgtttat tatattatta tcaacaataa 300
taatttaata ctgatcgaag aactttccct ttcaagttct ctatttaagg aagcctgaga 360
agccattaat cctcatcatc agctcgacca ctcatctctt cttcatactt cctttgctgt 420
gataatcatc atc 433

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<210> 7
<211> 818
<212> DNA
<213> Ipomoea batatas

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<220>
<221> promoter
<222> (1)..(818)
<223> -818 deletion promoter

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<400> 7
gcttcacgca ctcaactagt cacatctttc caggcaaaat ttacttttct atgaatatga 60
gaagttccat ctatggaaat aacggattat ttatotaatt ttcaaattct atatatatag 120
tctcgagtgg aacaaaaata gaactaattt gaacaaatca aagtctaaga aaataataca 180
tgcttttagca gcaaaaataa gaatggtact atacttaatc ctcatcatag tcttcaaccc 240
tgcatatagc acacttaaca ttttatattc aaatatactt taatttagtc atgataatac 300
aactcaccta ctccattata gccgataata caactcacct agctactcca ttatagtcca 360
acaatatcaa atgaataaaa tagtaatggt gacttaaagg gctgaatcca acatatattc 420
tgacatttaa aaatgctaac gtacggttag attagtataa tgaaataaag ttaatcatc 480
tctatatttg atgatggtaa ttagtatcat ggtaagggtg tttatcgtgg cagcatgagt 540
gcatgacaaa cgcataatatt attattaaaa caaatagta ctccaatcat aataaattat 600
cttatattat attgccaca attaaaaatt caaatagaa caaatataat ctacgtttgc 660
tttattatat tattatcaac aataataatt taatactgat cgaagaactt tccctttcaa 720
gttctctatt taaggaagcc tgagaagcca ttaatcctca tcatcagctc gaccactcat 780
ttcttcttca tacttccttt gctgtgataa tcatcatc 818

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<210> 8

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<211> 1199
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(1199)
 <223> -1199 deletion promoter

<400> 8
 atgcaggggtg aaagtaagat tgaatatact gatactacaa ttaactaatg ataaagtata 60
 actttttgtaa aaaatttgat tttttttttt gatgaattca tataactccaa agatttttcct 120
 catttaatta aattttctatc ctcatgttga acccattaat cgaataattg acatattaga 180
 taaacttagc catcatatga catttgatca tgattgatga tttttaaaaa ataaaaacaa 240
 aattatgaaa gggtaatgaa atatttttaa aaaattatgt aaaccctgta atctagtaat 300
 ctgtacaata ataattttgt ttcaactaag aggatgttgg caaaagtata attaaacttg 360
 tgatcttcgt acaataatta tgcttcacgc actcaactag tcacatcttt ccaggcaaaa 420
 tttacttttc tatgaatatg agaagttcca tctatggaaa taacggatta tttatctaata 480
 tttcaaattc tatatatata gtctcgagtg gaacaaaaat agaactaatt tgaacaaatc 540
 aaagtctaag aaaataatac atgcttttagc agcaaaaata agaatgggtac tataacttaat 600
 cctcatcata gtottcaacc ctgcatatag cactttaac attttatatt caaatatact 660
 ttaatttagt catgataata caactcacct actccattat agccgataat acaactcacc 720
 tagctactcc attatagtcc aacaatatca aatgaataaa atagtaatgg tgacttaaag 780
 ggctgaatcc aacatatatt ctgacattta aaaatgctaa cgtacgggta gattagtata 840
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 ttttatcgtg gcagcatgag tgcatgacaa acgcatatat tattattaaa acaaaatagt 960
 actccaatca taataaatta tcttatatta tattgccaac aattaaaaat tcaaattaga 1020
 acaaattaaa tctcagtttg ctttattata ttattatcaa caataataat ttaatactga 1080
 tcgaagaact ttccctttca agttctctat ttaaggaagc ctgagaagcc attaatcctc 1140
 atcatcagct cgaccactca tttcttcttc atacttcctt tgctgtgata atcatcatc 1199

<210> 9
 <211> 1467
 <212> DNA
 <213> Ipomoea batatas

<220>

<221> promoter
 <222> (1)..(1467)
 <223> -1467 deletion promoter

<400> 9
 ggctgtccgg aattctgtct ctctggacca gttttggcaa acaattttga aaccacactt 60
 atactactcc aaaaattatg aaatttttat ggtagcttct acacttatag aactacatgt 120
 ataaaaaata ttgggtcaaa ataccttacc gatttttccc aaatattcac ggaacttact 180
 gccagaatct accctgcttt ttccctttcac tattttcaca actataagca tatatgggca 240
 taaatatgac atgaacatgc atgaaccaat gcagggtgaa agtaagattg aatatactga 300
 tactacaatt aactaatgat aaagtataac ttttgtaaaa aatttgattt ttttttttga 360
 tgaattcata tactccaaag attttcctca ttttaattaaa tttctatcct catgttgaac 420
 ccattaatcg aataattgac atattagata aacttagcca tcatatgaca tttgatcatg 480
 attgatgatt tttaaaaaat aaaaacaaaa ttatgaaagg gtaatgaaat attttaaaaa 540
 aattatgtaa accctgtaat ctagtaatct gtacaataat aattttgttt caactaagag 600
 gatgttggca aaagtataat taaacttgtg atcttcgtac aataattatg cttcacgcac 660
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 tatggaaaata acggattatt tatctaattt tcaaatctta tatatatagt ctogagtgga 780
 acaaaaatag aactaatttg aacaaatcaa agtctaagaa aataatacat gcttttagcag 840
 caaaaataag aatggtacta tacttaatcc tcatcatagt cttcaacctt gcatatagca 900
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 tgaataaaat agtaatggtg acttaaaggg ctgaatccaa catatattct gacatttaaa 1080
 aatgctaacg tacggttaga ttagtataat gaaataaagt taatcattct ctatatttga 1140
 tgatggtaat tagtatcatg gtaagggtgtt ttatcgtggc agcatgagt catgacaaac 1200
 gcatatatta ttattaaaac aaaatagtac tccaatcata ataaattatc ttatattata 1260
 ttgccacaaa ttaaaaattc aaattagaac aaattaaatc tcagtttgc tttattatatt 1320
 attatcaaca ataataattt aatactgac gaagaacttt ccctttcaag ttctctattt 1380
 aaggaagcct gagaagccat taatcctcat catcagctcg accaotcatt tcttcttcat 1440
 acttcctttg ctgtgataat catcatc 1467

<210> 10

<211> 1934
 <212> DNA
 <213> Ipomoea batatas

<220>
 <221> promoter
 <222> (1)..(1934)
 <223> -1934 deletion promoter

<400> 10
 ttgccatctc accacttcgt cttaaacaat ctaggatatt cttagatatt cttcatactc 60
 aagtctcaca cttgaaatca atcaagactc ttactactaac aatttcctcaa tatacctcat 120
 aatatcatct ctacttaaac tagagagatt tccaactctc aattaatcac caaaggtaac 180
 tctccaaata tccaaatgga aggtttcaac ttccaaacta ataccaaacc aaccggacta 240
 atcataatca tattcataat cataaattgt ttctaactgc ccctgtccag aaattacagt 300
 tttgcgcagt ccgaaagatt gagccggtaa caatagttcc cgaactcttt ttactttgaa 360
 atttttatgg tagaacccta acttatagta cttgatatcc ataaaaagtt ttgggtcacct 420
 aggttcacga attaacacag aaaattacat ctttgccctt ggcagtgggc tgtccggaat 480
 tctgtctctc tggaccagtt ttggcaaaca attttgaaac cacacttata ctactccaaa 540
 aattatgaaa tttttatggt agcttctaca cttatagaac tacatgtata aaaaatattg 600
 ggtcaaaaata cottaccgat ttttcccaaa tattcacgga acttactgcc agaatctacc 660
 ctgctttttc ctttctactat tttcacaact ataagcatat atgggcataa atatgacatg 720
 aacatgcatg aaccaatgca ggggtgaaagt aagattgaat atactgatac tacaattaac 780
 taatgataaa gtataacttt tgtaaaaaat ttgatttttt tttttgatga attcatatac 840
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 aaaaaataaa aacaaaatta tgaaagggtg atgaaatatt ttaaaaaaat tatgtaaacc 1020
 ctgtaatcta gtaatctgta caataataat tttgtttcaa ctaagaggat gttggcaaaa 1080
 gtataattaa acttgtgatc ttogtacaat aattatgctt cacgcactca actagtcaca 1140
 tctttccagg caaaatttac ttttctatga atatgagaag ttccatctat ggaaataacg 1200
 gattatttat ctaattttca aattctatat atatagtctc gagtggaaaca aaaatagaac 1260
 taatttgaac aaatcaaagt ctaagaaaat aatacatgct ttagcagcaa aaataagaat 1320
 ggtactatac ttaatcctca tcatagtctt caaccctgca tatagcacac ttaacatttt 1380
 atattcaaat atactttaat ttagtcatga taatacaact cacctactcc attatagccg 1440

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ataatacaac tcacctagct actccattat agtccaacaa tatcaaatga ataaaatagt 1500
aatggtgact taaagggctg aatccaacat atattctgac atttaaaaat gctaacgtac 1560
ggtttagatta gtataatgaa ataaagttaa tcattctcta tatttgatga tggtaattag 1620
tatcatggta aggtgtttta tcgtggcagc atgagtgcac gacaaacgca tatattatta 1680
ttaaacaaca atagtactcc aatcataaça aattatctta tattatattg ccaacaatta 1740
aaaattcaaa ttagaacaaa ttaaactctca gtttgcttta ttatattatt atcaacaata 1800
ataatttaaat actgatcgaa gaactttccc tttcaagttc tctatttaag gaagcctgag 1860
aagccattaa tcctcatcat cagctcgacc actcatttct tcttcatact tcctttgctg 1920
tgataatcat catc 1934

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<210> 11
<211> 2433
<212> DNA
<213> Ipomoea batatas

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<220>
<221> promoter
<222> (1)..(2433)
<223> -2433 promoter

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<400> 11
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acttcaagct ctttatcccg taggctgcaa caacataacg acataacgac cactgggcaa 180
gggcatttac agccaccctg gggatcaatca aggtcctcct cactcacttt agaaactaag 240
ggtttgaaaa catgatcttt ccttcagttt ttcttacaac aaatcattca ctttggacac 300
atttcacaat tgagtccaat acttaaaccg gctacttcat tagccctga aggattttta 360
aaaaaacttt cactgcccgc aggtctttca aacatctttt cctcattatc aagtgaggca 420
ttttcctcaa aagtaagggt ttgacaacct ttatatcaaa atagcatacg tttttcaacg 480
taagtttcat aacatttact tgccatctca ccacttogtc ttaaacaatc taggatattc 540
ttagatattc ttcatactca agtctcacac ttgaaatcaa tcaagactct tacactaaca 600
attcctcaat atacctcata atatcatctc tacttaaaact agagagattt ccaactctca 660
attaatcacc aaaggtaact ctccaaatat ccaaattgaa ggtttcaact tccaaactaa 720
taccaaacca accggactaa tcataatcat attcataatc ataaattggt tctaactgcc 780

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cctgtccaga aattacagtt ttgcgcgagtc cgaaagattg agccggtaac aatagttccc 840
gaactctttt tcacttgaaa ttttttatggt agaaccctaa cttatagtac ttgatatcca 900
taaaaagttt tggtcaccta ggttcacgaa ttaacacaga aaattacatc tttgcccttg 960
gcagtgggct gtccggaatt ctgtctctct ggaccagttt tggcaaacaa ttttgaaacc 1020
acacttatac tactccaaaa attatgaaat ttttatggta gcttctacac ttatagaact 1080
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cttactgcca gaatctaccc tgctttttcc tttcactatt ttcacaacta taagcatata 1200
tgggcataaa tatgacatga acatgcatga accaatgcag ggtgaaagta agattgaata 1260
tactgatact acaattaact aatgataaag tataactttt gtaaaaaatt tgattttttt 1320
ttttgatgaa ttcatatact ccaaagattt tcctcattta attaaatttc tatcctcatg 1380
ttgaaccocat taatcgaata attgacatat tagataaact tagccatcat atgacatttg 1440
atcatgattg atgattttta aaaaataaaa acaaaattat gaaagggtaa tgaaatatatt 1500
taaaaaaatt atgtaaaccc tgtaatctag taatctgtac aataataatt ttgtttcaac 1560
taagaggatg ttggcaaaag tataattaata cttgtgatct tcgtacaata attatgcttc 1620
acgcactcaa ctagtcacat ctttccaggc aaaatttact tttctatgaa tatgagaagt 1680
tccatctatg gaaataacgg attattttatc taattttcaa attctatata tatagtctcg 1740
agtggaacaa aatagaact aatttgaaca aatcaaagtc taagaaaata atacatgctt 1800
tagcagcaaa aataagaatg gtactatact taatcctcat catagtcttc aacctgcat 1860
atagcacact taacatttta tattcaaata tactttaatt tagtcatgat aatacaactc 1920
acctactcca ttatagccga taatacaact cacctagcta ctccattata gtccaacaat 1980
atcaaagtaa taaaatagta atgggtgactt aaagggtga atccaacata tattctgaca 2040
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acaaacgcat atattattat taaaacaaaa tagtactcca atcataataa attatottat 2220
attatatgtc caacaattaa aaattcaaat tagaacaaat taaatctcag tttgctttat 2280
tatattatta tcaacaataa taatttaata ctgatcgaag aactttccct ttcaagttct 2340
ctatttaagg aagcctgaga agccattaat cctcatcatc agctcgacca ctcatctctt 2400
cttcatactt cctttgctgt gataatcatc atc 2433

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<210> 12

<211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> GSP1 promoter

<400> 12
 ctgagccgag tgacaaagga agccat 26

<210> 13
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> AP1 promoter

<400> 13
 gtaatacgac tcactatagg gc 22

<210> 14
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> GSP2 promoter

<400> 14
 cacagcaaag gaagtatgaa gaagc 25

<210> 15
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> AP2 promoter

<400> 15
 actatagggc acgcgtggt 19

<210> 16
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> exon promoter

<400> 16
atggcttcct ttgtcactcg gctcag 26

<210> 17
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> intron promoter

<400> 17
tcacagctc gaccactcat ttctttcttca 30

<210> 18
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> forward promoter for -2433 deletion promoter

<400> 18
gccaaagcttg gtcctcatgg agtattctca taact 35

<210> 19
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -1934 deletion promoter

<400> 19
gccaaagcttt tgccatctca ccaattcgtc tta 33

<210> 20
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer for -1467 deletion promoter

<400> 20
gccaaagcttg gctgtccgga attctgtctc t 31

<210> 21
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> forward primer for -1199 deletion promoter

<400> 21
 gccaaagctta tgcaggggtga aagtaagatt gaa 33

<210> 22
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> forward primer for -818 deletion promoter

<400> 22
 gccaaagcttg cttcacgcac tcaact 26

<210> 23
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> forward primer for -433 deletion promoter

<400> 23
 gccaaagctta tgggtgactta aaggggtgaa tcc 33

<210> 24
 <211> 34
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> reverse primer for -2433, 1934, 1467, 1199, 818, 433, 366, 306,
 177 and 110 deletion promoter

<400> 24
 tcctctagag atgatgatta tcacagcaaa ggaa 34

<210> 25
 <211> 31
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> forward primer for -366 deletion promoter

<400> 25
 ttctctgcaga tagtataatg aaataaagtt a 31

<210> 26
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> forward primer for -306 deletion promoter

<400> 26
 tttctgcagt aaggtgtttt atcgtg 26

<210> 27
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> forward primer for -177 deletion promoter

<400> 27
 ttctctgcaga aattaaatct cagtt 25

<210> 28
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> forward primer for -110 deletion promoter

<400> 28
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<210> 29
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> forward primer for NPTII

<400> 29
 gaggtattc ggctagatg 19

<210> 30
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> reverse primer for NPTII

<400> 30
atcgggagcg gcgataccgt a

21